

WHAT IS CLAIMED IS:

1. A polypeptide of (a) or (b) below:

(a) a polypeptide consisting of an amino acid sequence represented by the amino acid Nos. 46-353 in SEQ ID NO: 2; or

(b) a polypeptide which comprises an amino acid sequence including substitution, deletion, insertion or transposition of one or few amino acids in the amino acid sequence of (a) and which has an enzymatic activity to transfer a galactose residue from a galactose donor to C4 position of galactose residue of lactosylceramide or galactosylceramide which serves as an acceptor.

2. A polypeptide of (a') or (b') below:

(a') a polypeptide consisting of an amino acid sequence represented by the amino acid Nos. 20-353 in SEQ ID NO:2; or

(b') a polypeptide which comprises an amino acid sequence including substitution, deletion, insertion or transposition of one or few amino acids in the amino acid sequence of (a') and which has an enzymatic activity to transfer a galactose residue from a galactose donor to C4 position of galactose residue of lactosylceramide or galactosylceramide which serves as an acceptor.

3. A polypeptide of (a'') or (b'') below:

(a'') a polypeptide consisting of an amino acid sequence represented by SEQ ID NO:2; or

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(b'') a polypeptide which comprises an amino acid sequence including substitution, deletion, insertion or transposition of one or few amino acids in the amino acid sequence of (a'') and which has an enzymatic activity to transfer a galactose residue from a galactose donor to C4 position of galactose residue of lactosylceramide or galactosylceramide which serves as an acceptor.

4. A DNA encoding the polypeptide according to any one of claims 1 to 3.

5. The DNA according to claim 4 represented by (a) or (b) below:

(a) a DNA comprising a nucleotide sequence represented by nucleotide Nos. 269 to 1192 in SEQ ID NO:1; or

(b) a DNA hybridizable with a DNA comprising a nucleotide sequence represented by SEQ ID NO:1, a nucleotide sequence complementary to SEQ ID NO:1, or a part of those sequences, under a stringent condition.

6. The DNA according to claim 5 encoding a polypeptide having an enzymatic activity to transfer a galactose residue from a galactose donor to C4 position of galactose residue of lactosylceramide or galactosylceramide which serves as an acceptor.

7. A recombination vector containing the DNA as described in any one of claims 4 to 6.

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8. A transformed cell obtained by transfecting a host cell with the DNA according to any one of claims 4 to 6, or the recombination vector according to claim 7.

9. A method for producing the polypeptide according to any one of claims 1 to 3, comprising the steps of:

expressing the polypeptide according to claims 1 to 3 by culturing the transformed cell according to claim 8 in a medium suitable for expressing the polypeptide; and

recovering said polypeptide from the medium and/or a cell extract of the cultured transformed cell.

10. A method for producing Gb3/CD77, comprising the steps of:

exposing the polypeptide according to any one of claims 1 to 3, or a cultured product of the transformed cell according to claim 8, to lactosylceramide, to cause thereby enzymatic reaction; and recovering Gb3/CD77.

11. A method for producing a glycolipid represented by the following formula (1), comprising the steps of:

exposing the polypeptide according to any one of claims 1 to 3, or a cultured product of the transformed cell according to claim 8, to galactosylceramide, to cause thereby enzymatic reaction; and recovering the glycolipid represented by the following formula (1):

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Gal α 1 \rightarrow 4Gal-Cer (1)

wherein Gal represents a galactose residue, Cer represents a ceramide residue and α 1 \rightarrow 4 represents an α 1-4 glycosidic linkage.

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